

I am concerned about climate breakdown

I am BEYOND EXTREMELY concerned about climate
breakdown

fossil fuel causes harm

I use satellite data and computer models to study:

low marine clouds (one of Earth's “air conditioners”)



I use satellite data and computer models to study:

**Extreme
convective
storm
environments**



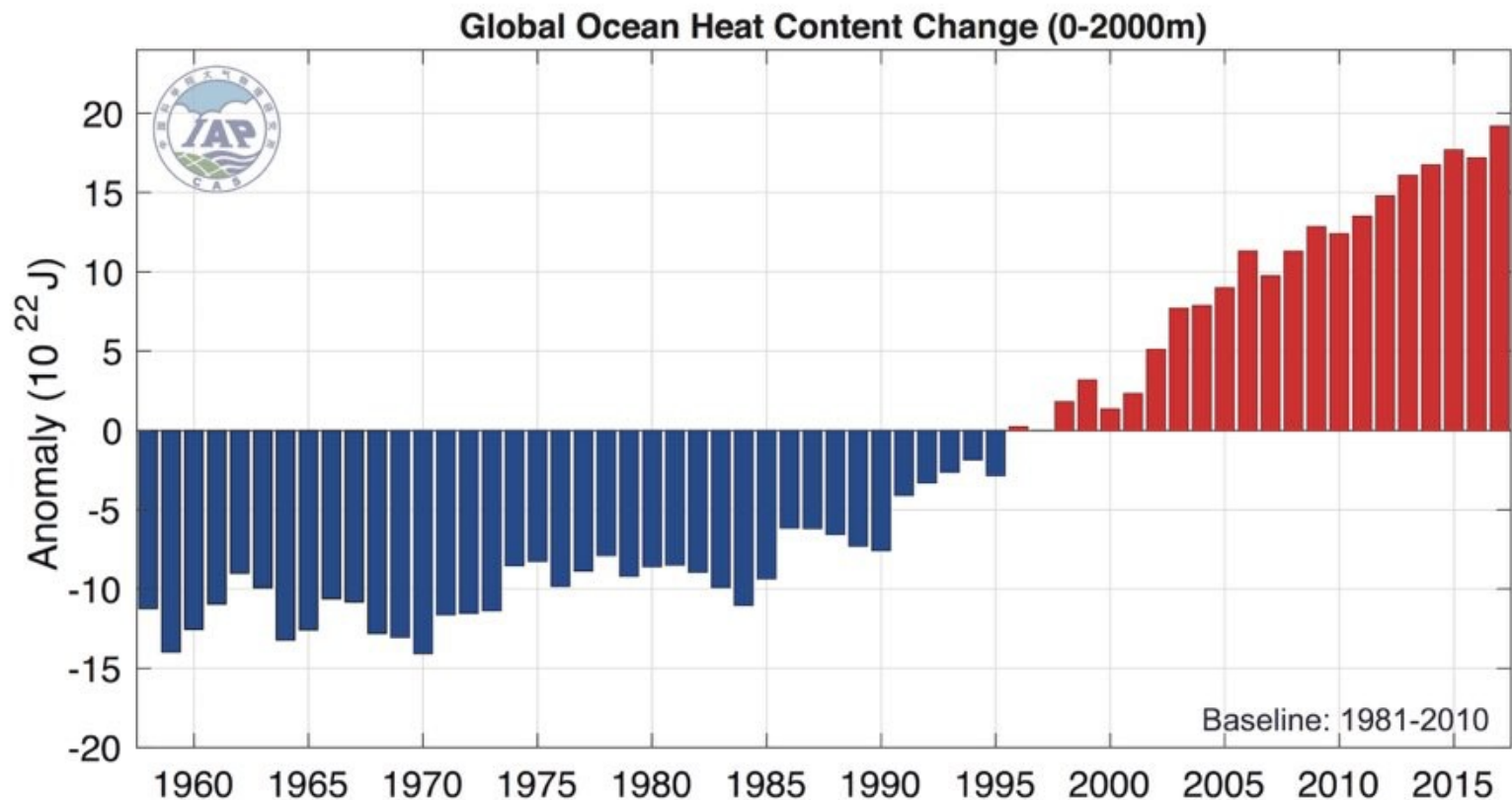
I use satellite data and computer models to
study:

**the future of ecosystems
on a hotter planet**

low marine clouds extreme storm



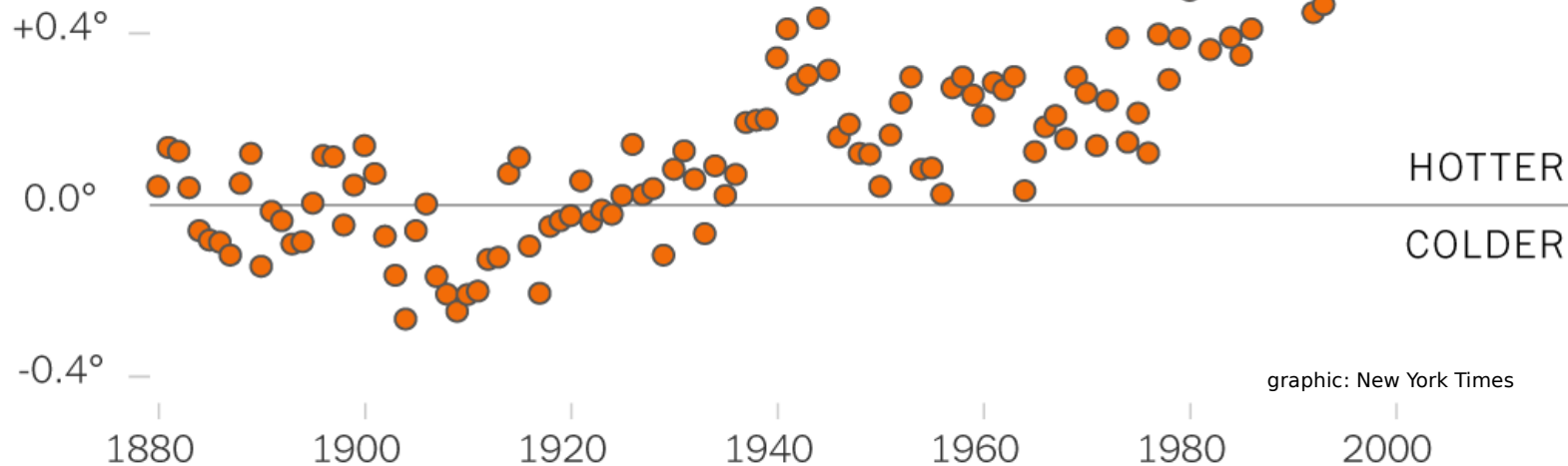
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+1.2° – Annual Global Surface Temperature,
Relative to Late 19th Century Average

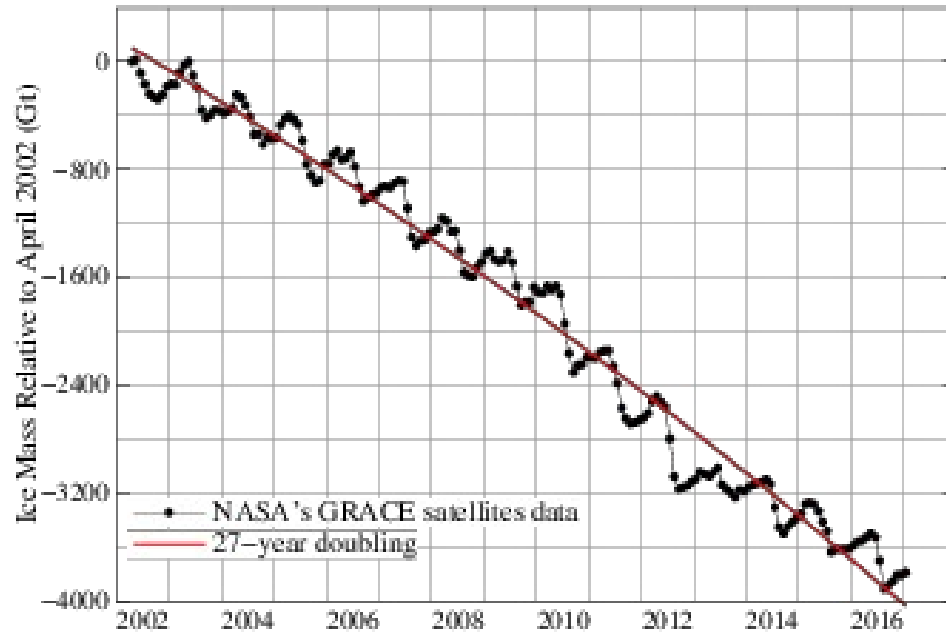
+0.8° 18 of the 19 hottest years occurred since 2001.



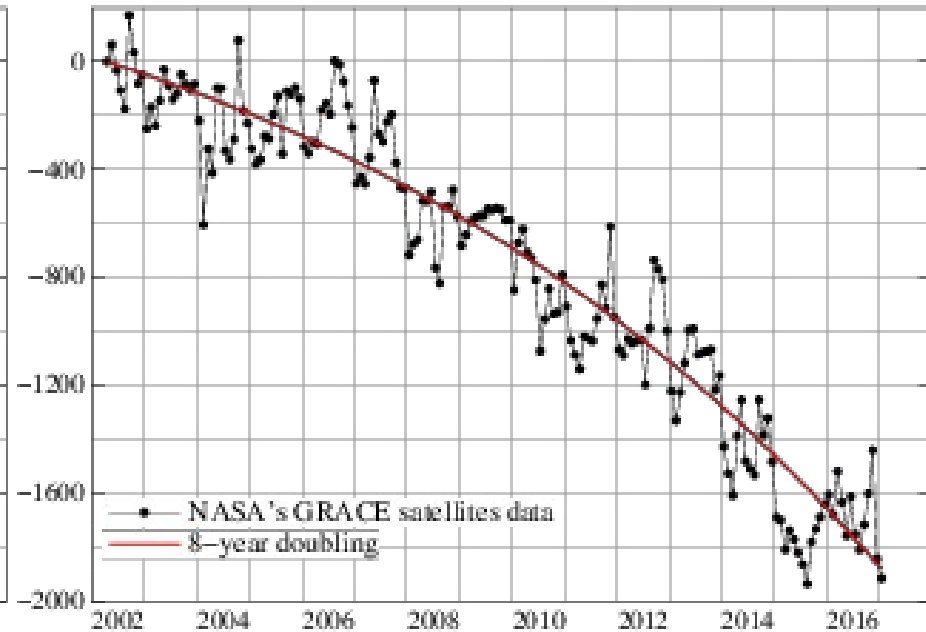
graphic: New York Times

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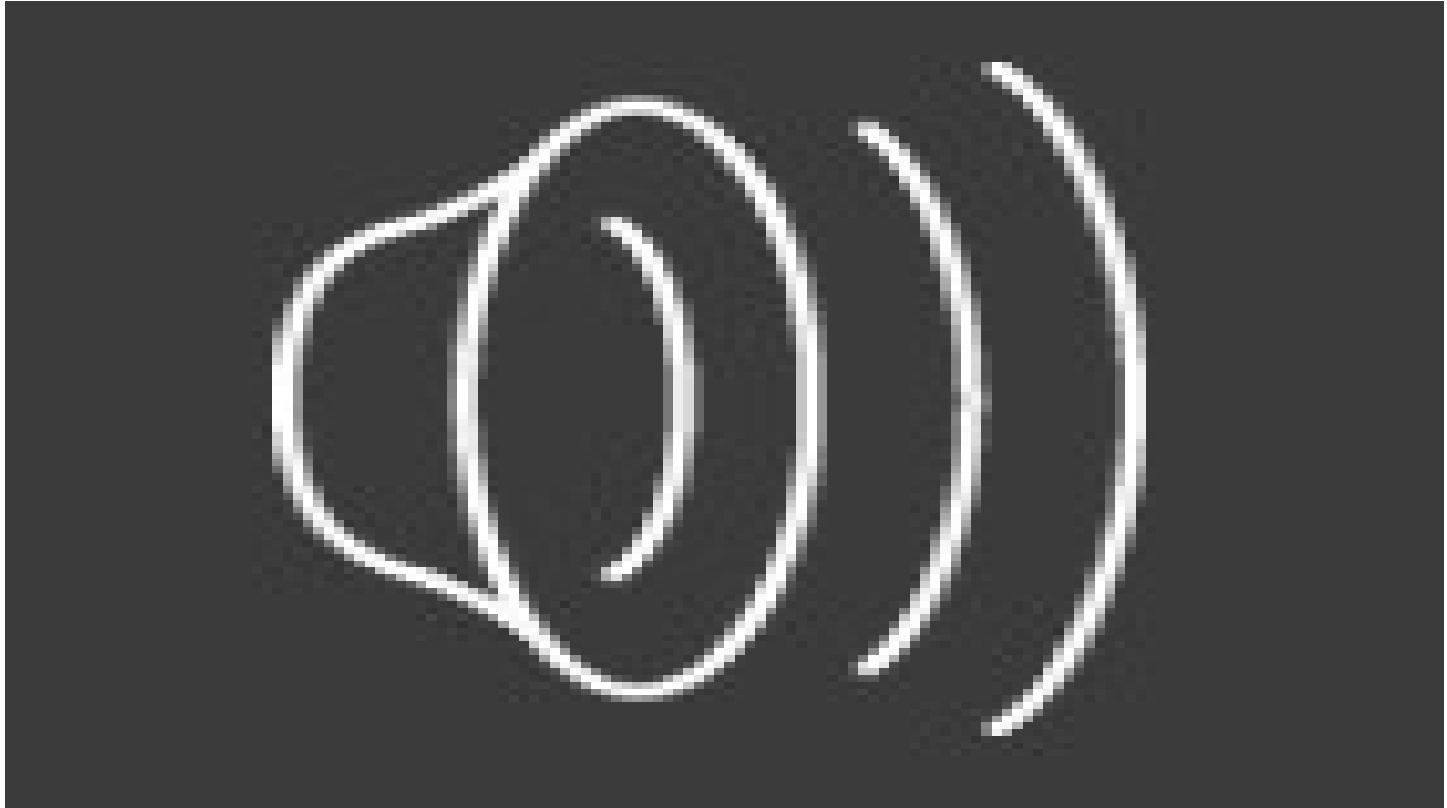
(a) Greenland Ice Mass Change



(b) Antarctica Ice Mass Change



What fossil fuels are doing to the planet's glaciers



Just 8 years

Clear and present danger to complex global 8+ billion civilization

Hotter conditions could last thousands of years

Biodiversity loss could last ten million years

Unknown unknowns mean model projections are likely too conservative

I'm also a climate activist



Unfortunate facts from Shell's past



CONFIDENTIAL

“Shell knew” for decades

e.g. 1988 Shell internal report

e.g. 1991 Shell film “Climate of Concern”

warned of sea level rise, extreme weather, floods, famines,
climate refugees

THE GREENHOUSE EFFECT

But nonetheless, during the subsequent decades:

Shell has made no significant shift away from developing fossil
fuel

Shell has consistently lobbied against climate action

Fair or not, this is how climate activists see oil corporations



Recent surge in the public's sense of urgency

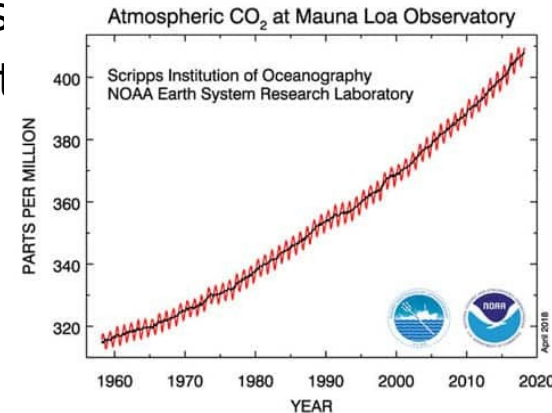
Scientists beginning to speak without reticence and with appropriate urgency

Increasingly frequent and severe climate-related catastrophes
heatwaves, fires, floods, droughts, hurricanes, climate refugees

Surge of protest

school strikes, civil disobedience, political press
climate rose to top of list of issues for democrats

Driven by physics + exponentially accelerating use
it will not go away









The world is at stake

The oil corporation that gets out in front of change could gain strategic advantage

Long-term financial advantage?

At some point, somehow, fossil fuel will be phased out
plan to *really* transition to carbon-free energy and become market leader

Lowered liability?

The judiciary is subject to whims of culture just like any other human institution

at some point judges may become much less inclined to leniency
the corporation leading the transition would “win” in the court of¹⁹

Stay **completely** out of politics. No more contributions, no more lobbying

Make plan for substantial voluntary transition away from fossil fuels

Sticking to it will be the **only** way to gain public trust as public urgency surges

Unprecedented in the history of corporations?

Make no climate policy recommendations

Letter of support with Exxon and BP for Baker-Schultz carbon fee was a disaster

Anything you recommend will set the activists against it

Carbon fee and dividend is essential

Become the good guys

Not only from your own point of view...

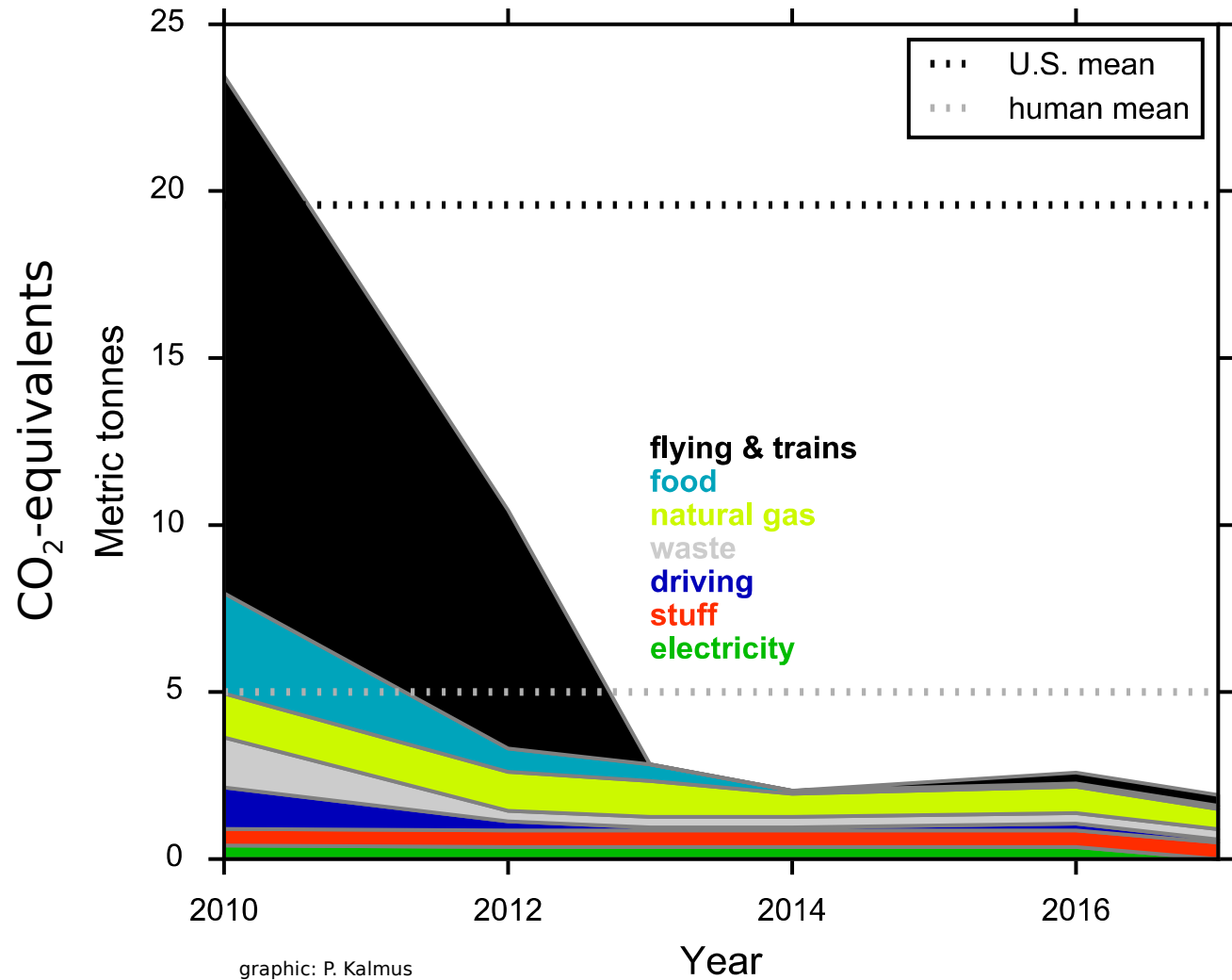


Become the good guys

...but from theirs

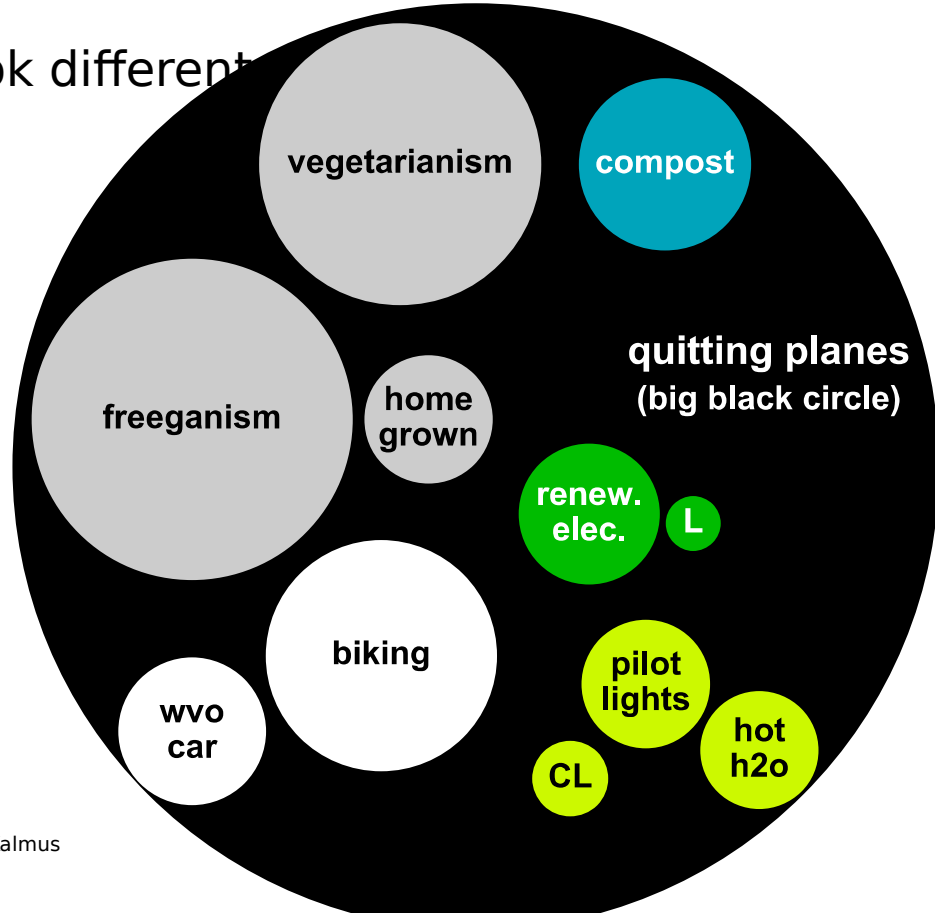


extra slides



My most significant changes

Everyone's will look different



Potential surprises

CSSR: “Both large-scale state shifts in the climate system and compound extremes have the potential to generate unanticipated climate surprises. The more the climate changes, the greater the potential for these surprises.”

Tipping points: ice sheets, arctic carbon reservoirs, Amazon rainforest
Case study: sea ice decline has consistently outpaced model projections

Compound extremes: fires + extreme rain + mudslides; drought + heatwaves + snowpack

Unknown unknowns: “The systematic tendency of climate models to underestimate temperature change during warm paleoclimates suggests that climate models are more likely to underestimate than to overestimate



m future c
models can



the range

Photos: Katey Anthony